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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/013,087	12/07/2001	Hideyuki Andoh	44471-267680 (13700)	1427

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EXAMINER

SCHILLINGER, LAURA M

ART UNIT PAPER NUMBER

2813

DATE MAILED: 03/31/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/013,087

Applicant(s)

ANDOH, HIDEYUKI

Examiner

Laura M Schillinger

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 10 and 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 6 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

**This Office Action is in response to the Election made in Paper No.8, dated 12/9/02.**

#### *Election/Restrictions*

Claims 10-11 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 8.

#### *Claim Objections*

Claims 9 and 6 objected to because of the following informalities: “trough” likely should be “through”. Appropriate correction is required.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Jambotkar ('857).

In reference to claim 1, Jambotkar teaches a device comprising:

A first semiconductor region of a first conductivity type, defined by a first end surface and a side boundary surface connecting the first and second end surfaces (Fig.2A (16));

A second semiconductor region of the first conductivity type connected with the first semiconductor region at the second end surface (Fig.2A (14));

A third semiconductor region of a second conductivity type connected with the first semiconductor region at the first end surface (Fig.2A (12)); and

A fourth semiconductor region having inner surface in contact with the side boundary surface and an impurity concentration lower than the first semiconductor region, configured such that the fourth semiconductor region surrounds the first semiconductor region, the fourth semiconductor region is disposed between the second and third semiconductor regions (Fig.2A (10)).

In reference to claim 2, Jambotkar teaches wherein the fourth semiconductor region has a first type conductivity (Fig.2A (10)).

In reference to claim 3, Jambotkar teaches wherein outer surface of the fourth semiconductor region serves as a chip outer surface of the semiconductor device and the chip outer surface is substantially orthogonal with the second end surface of the first semiconductor region.

In reference to claim 4, Jambotkar teaches wherein the fourth semiconductor region is made of a wafer cut from bulk crystal (Fig.2A (10) and Col.7, lines: 15-20).

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In reference to claim 5, Jambotkar teaches further comprising a first main electrode layer is formed on a bottom surface of the second semiconductor region (Fig.2A (S1)).

In reference to claim 6, Jambotkar teaches wherein the first main electrode layer is contacted with the second semiconductor region, through a first concavity formed at the bottom surface of the second semiconductor region (Fig.3 (20')).

In reference to claim 7, Jambotkar teaches further comprising a first main electrode layer, a part of the first main electrode layer is buried in a via hole penetrating through the second semiconductor region, configured such that the buried part of the first main electrode layer contacts with the first semiconductor region (Fig.2A (S1)).

In reference to claim 8, Jambotkar teaches further comprising a second main electrode layer is formed on a top surface of the third semiconductor region (Fig.4A (G1)).

In reference to claim 9, Jambotkar teaches wherein the second main electrode layer is contacted with the first semiconductor regions, through a second concavity formed at the top surface of the third semiconductor region (Fig.3 (20')).

### *Conclusion*


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M Schillinger whose telephone number is (703) 308-6425. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W Whitehead, Jr. can be reached on (703) 308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

LMS  
March 24, 2003

  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800